

**WE CLAIM:**

1. A metered water control system for flush toilet tanks, comprising:

an inlet tube that receives water from a water line and conducts water into the interior of the tank to a diverter;

a diverter that channels the flow of water received from the inlet tube to cause mechanical motion responsive to the channeled flow;

a control valve, responsive to a mechanical switch that opens and closes access of the water from the inlet tube to the diverter;

a mechanical switch, responsive to the mechanical motion caused by the flow of water from the diverter, that closes the control valve automatically when a pre-determinable volume of water flows through the diverter;

a discharge tube that receives water from the diverter to discharge the water into the tank; and

an actuator linked to a flush arm of the toilet and linked to the mechanical switch to cause the switch to open the control valve in response to motion of the flush arm to allow the pre-determined volume of water to flow through the diverter into the discharge tube.

2. The system of Claim 1, wherein the inlet tube passes through the interior of the discharge tube.

3. The system of Claim 1, wherein the mechanical switch further comprises:

a cam that moves in response to mechanical motion caused by the flow of water from the diverter; and

a cam engager linked to the actuator that causes the control valve to open in response to motion of the actuator, and that causes the control valve to close in response to a pre-determinable extent of motion of the cam.

4. The system of Claim 3, wherein the cam engager:

causes the control valve to open by unsealing an outlet of the control valve to cause water pressure to force water to flow from the inlet tube through the diverter; and

causes the control valve to close by sealing the outlet to create pressure that prevents water from flowing from the inlet tube through the diverter.

5. The system of Claim 4, wherein the cam engager further engages a seal arm to seal and unseal the outlet.

6. The system of Claim 1, wherein the actuator is positioned partially within an actuator housing that restrains the actuator to be partially retained therein.

7. The system of Claim 1, wherein the mechanical switch closes the control valve independently from the actuator.

8. The system of Claim 1, wherein the inlet tube conducts the water from the water line to a level above the water line of the tank.

9. A metered water control method for flush toilet tanks, comprising the steps of:

receiving water from a water line into an inlet tube that conducts water into the interior of the tank;

diverting water received from the inlet tube to channel water flow to cause mechanical motion in response to the channeled flow.

controlling flow of the water from the inlet tube in response to a mechanical switch;

providing a mechanical switch, responsive to the mechanical motion caused by the diversion of the flow of water from the inlet tube, that automatically prevents water from flowing from the inlet tube when a pre-determinable volume of water flows therefrom;

discharging into the tank the water diverted from the inlet tube; and

providing an actuator linked to a flush arm of the toilet and linked to the mechanical switch to cause the switch to allow the pre-determined volume of water to flow from the inlet tube and be discharged into the tank in response to motion of the flush arm.

10. The method of Claim 9, wherein the inlet tube passes through the interior of a tube that discharges water from the inlet tube into the tank.

11. The method of Claim 9, wherein the mechanical switch further comprises:

a cam that moves in response to mechanical motion caused by the flow of water from the diverter; and

a cam engager linked to the actuator that causes water to flow from the inlet tube to be channeled in response to motion of the actuator, and that prevents water from flowing from the inlet tube in response to a pre-determinable extent of motion of the cam.

12. The method of Claim 11, wherein the cam engager:

causes an outlet of a control valve to become unsealed to cause water pressure to force water to flow from the inlet tube through the diverter; and

causes an outlet of the control valve to be sealed to create pressure that prevents water from flowing from the inlet tube through the diverter.

13. The method of Claim 11, wherein the cam engager further engages a seal arm to seal and unseal the outlet of a control valve to disable or enable the flow of water from the inlet tube.

14. The method of Claim 9, wherein the actuator is positioned partially within an actuator housing that restrains the actuator to be partially retained therein.

15. The method of Claim 9, wherein the mechanical switch operates to disable the flow of water from the inlet tube independently from the operation of the actuator.

16. The method of Claim 9, wherein the inlet tube conducts the water from the water line to a level above the water line of the tank.

17. A metered water control system for flush toilet tanks, comprising:

an inlet tube that receives water from a water line and conducts water into the interior of the tank to a diverter;

a diverter that channels the flow of water received from the inlet tube to cause mechanical motion of a wheel geared to a cam in response to the channeled flow;

a control valve, responsive to a mechanical switch, that enables and disables the flow of water from the inlet tube to the diverter; and

a mechanical switch, responsive to the mechanical motion caused by the flow of water from the diverter, which closes the control valve automatically when a pre-determinable volume of water flows through the diverter.

18. The system of Claim 17, wherein said mechanical switch further comprises:

a cam that moves in response to mechanical motion caused by the flow of water from the diverter;

a cam engager linked to an actuator that causes the control valve to open in response to motion of the actuator, and that causes the control valve to close in response to a pre-determinable extent of motion of the cam;

a discharge tube that receives water from the diverter to discharge the water into the tank; and

an actuator linked to a flush arm of the toilet and linked to the mechanical switch to cause the switch to open the control valve in response to motion of the flush arm to allow the pre-determined volume of water to flow through the diverter into the discharge tube.

19. The system of Claim 17, wherein the cam engager:

causes the control valve to open by unsealing an outlet of the control valve to cause water pressure to force water to flow from the inlet tube through the diverter; and

causes the control valve to close by sealing the outlet to create pressure that prevents water from flowing from the inlet tube through the diverter.

20. The system of Claim 17, wherein the inlet tube passes through the interior of the discharge tube to conduct water received from the water line to a level above the water line of the tank.

21. The system of Claim 17, wherein the mechanical switch closes the control valve independently from the actuator.